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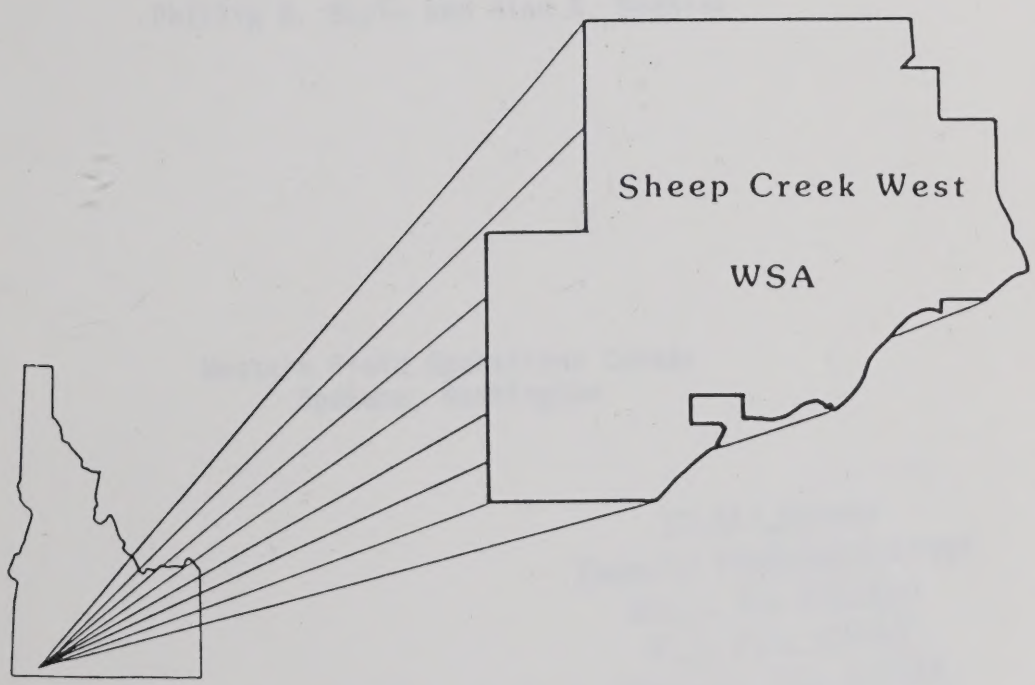

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MINERAL RESOURCES OF THE SHEEP CREEK WEST WILDERNESS STUDY AREA, OWYHEE COUNTY, IDAHO

By
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PREFACE

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered land designated as Wilderness Study Areas ". . . to determine the mineral values, if any, that may be present . . ." Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of the Sheep Creek West Wilderness Study Area (ID-111-36A), Owyhee County, ID.

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, WA 99202. The report has been edited by members of the Branch of Mineral Land Assessment at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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SUMMARY

In 1985 the U.S. Bureau of Mines evaluated the mineral resources of the Sheep Creek West Wilderness Study Area (ID-111-36A), Owyhee County, ID, for the U.S. Bureau of Land Management. The Wilderness Study Area consists of 11,680 acres centered approximately 20 miles south of Grasmere, ID. It contains no mines, claims, or prospects.

No mineral resources were identified; however, a geode occurrence within and adjacent to the Wilderness Study Area, and minor amounts of placer gold along Sheep Creek, may be of interest to rockhounds and recreational gold panners.

INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) portion of a cooperative study with the USGS (U.S. Geological Survey) to evaluate the mineral resources and potential of the Sheep Creek West WSA (Wilderness Study Area) 1/ at the request of the BLM (U.S. Bureau of Land Management). The USBM examines individual mines, prospects, claims, and mineralized zones, and evaluates identified mineral and energy resources. The USGS evaluates potential for undiscovered resources based on areal geological, geochemical, and geophysical surveys. The USBM and the USGS investigations are summarized in a joint report used to help determine the suitability of the WSA for inclusion into the National Wilderness Preservation System. Although the immediate goal of this USBM study is to provide data for the President, Congress, BLM, and the general public for land-use decisions, the long-term objective is to help ensure that the Nation has an adequate and dependable supply of minerals at a reasonable cost.

Setting

The Sheep Creek West WSA includes 11,680 acres in Owyhee County, ID (fig. 1). The area boundary generally follows section lines or jeep trails; the WSA roughly covers an area of 4 mi (miles) by 5 mi including about 6.5 mi of the precipitous Sheep Creek canyon.

Grasmere, ID, lies about 20 mi to the north of the WSA, and Mountain City, NV, is about 13 mi to the south (fig. 1). Access is by graded and unimproved roads from State Highway 51 which arcs around the WSA, about 10 mi to the north, west, and south. The northern and eastern boundaries of the WSA are penetrated by four unimproved roads and jeep trails (fig. 2).

1/ A WSA is a roadless area or island that has been inventoried by the BLM and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 (90 Stat. 2785) and Section 2 (c) of the Wilderness Act of 1964 (78 Stat. 891).

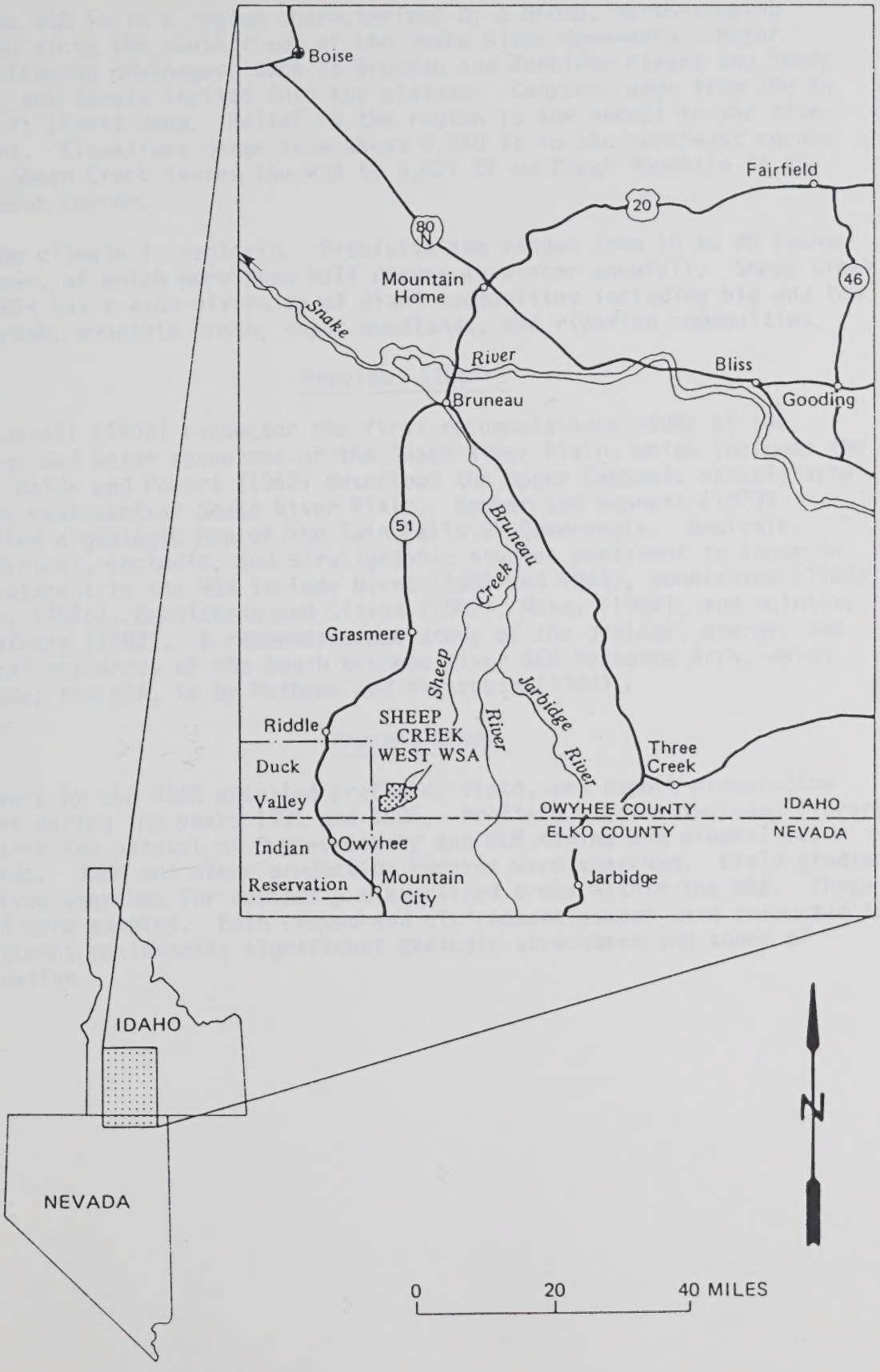

FIGURE 1. — Location of the Sheep Creek West Wilderness Study Area (D-111-36A), Owyhee County, ID

The WSA is in a region characterized by a broad, north-sloping plateau along the south flank of the Snake River down-warp. Major north-flowing drainages, such as Bruneau and Jarbidge Rivers and Sheep Creek, are deeply incised into the plateau. Canyons range from 300 to 1,000 ft (feet) deep. Relief in the region is low except in the river canyons. Elevations range from about 5,240 ft in the northeast corner where Sheep Creek leaves the WSA to 6,821 ft on Rough Mountain in the southwest corner.

The climate is semiarid. Precipitation ranges from 10 to 20 inches per year, of which more than half occurs as winter snowfall. Sheep Creek West WSA has a wide diversity of plant communities including big and low sagebrush, mountain brush, aspen woodlands, and riparian communities.

Previous Studies

Russell (1902) conducted the first reconnaissance study of the geology and water resources of the Snake River Plain, which includes the WSA. Malde and Powers (1962) described the upper Cenozoic stratigraphy of the west-central Snake River Plain. Rember and Bennett (1979) compiled a geologic map of the Twin Falls 2^{o} Quadrangle. Geologic, geophysical, tectonic, and stratigraphic studies pertinent to lands in and adjacent to the WSA include Bernt (1982 and 1983), Bonnichsen (1982a, 1982b, 1982c), Bonnichsen and Citron (1982), Mabey (1982), and McIntyre and others (1982). A reconnaissance study of the geology, energy, and mineral resources of the South Bruneau River GEM Resource Area, which includes the WSA, is by Mathews and Blackburn (1983).

Present Study

Work by the USBM entailed prefield, field, and report preparation phases during the years 1985 and 1986. Prefield studies included library research and perusal of Owyhee County and BLM mining and mineral lease records. USBM and other production records were searched. Field studies involved searches for obviously mineralized areas within the WSA. Those found were sampled. Both ground and air reconnaissance were conducted in an attempt to identify significant geologic structures and zones of alteration.

One select rock sample 2/ was collected, and five reconnaissance pan samples 3/ of sand and gravel were taken to determine placer gold concentrations (fig. 2). The rock sample was crushed, pulverized, split, mixed, and analyzed by fire-assay for gold and silver; by inductively coupled argon-plasma spectrophotometry for copper, lead, and zinc; and by one of several methods for mercury. Placer samples, partially concentrated in the field, were further concentrated on a laboratory-sized Wilfley table. Resulting heavy-mineral fractions were scanned with a binocular microscope to determine content. The gold detected was recovered by amalgamation and then weighed. Concentrates were also checked for radioactivity and fluorescence.

ACKNOWLEDGEMENTS

Personnel at the BLM Boise District office provided logistical support and information pertinent to the WSA.

GEOLOGIC SETTING

The Sheep Creek West WSA lies in the Owyhee Upland subprovince of the Columbia Intermontane physiographic province (Thornbury, 1965). Rhyolite of Sheep Creek, of probable Miocene age, is the oldest rock exposed within the WSA; however, Cretaceous-age biotite granodiorite crops out about 2 mi to the southeast (Bernt, 1983). Miocene- to Early Pliocene-age rhyolitic ash-flow tuffs and basalt flows of the Idavada Volcanics were erupted from a nearby source area now named the Bruneau-Jarbidge eruptive center, a region of complex, bimodal, basalt-rhyolite volcanism (Bonnichsen, 1982b, p. 237-238). Within the WSA, six separate flow units of the Cougar Point Tuff member of the Idavada Volcanics are identified by Bernt (1983). The tuff is exposed primarily in the stream canyon. The remainder of the WSA is covered by Pliocene-age flows of Banbury Basalt. In some areas, minor sedimentary interbeds of lacustrine (lake) origin are seen, especially between the flow units of the Banbury Basalt. Although sediments associated with the Banbury Basalt contain significant industrial mineral deposits (diatomite, clay, etc.) in some areas of southern Idaho, no such deposits were observed within or near the WSA.

Numerous northwest-trending normal faults, which dip to the north, cut the WSA. A secondary set of faults trend northeast (Bernt, 1983).

2/ A select rock sample contains pieces of rock chosen, generally from the apparently best mineralized parts of a pile or exposure, or of any particular fraction (e.g., quartz, host rock).

3/ A reconnaissance pan sample consists of one level 14-in. (inch)-diameter pan containing approximately 0.004 yd^3 (cubic yards) of alluvium concentrated to check for the presence of gold and other heavy minerals.

MINERALIZED AREAS

Three mining districts discovered in 1869, Hicks and Gold Basin to the southeast and Mountain City to the south, are about 8 to 12 mi from the WSA in Elko County, NV (Granger and others, 1957; Smith, 1976). Primary production in the districts was gold from lode and placer deposits. Production from the Mountain City mining district also included silver, copper, lead, zinc, manganese, tungsten, and uranium (Smith, 1976, p. 116-127). However, within the WSA, no claims have been located, no mineral production has been recorded, and no workings are in evidence.

Gold was recovered from two of the five reconnaissance placer samples taken from drainages within and adjacent to the WSA (fig. 2, nos. 3 and 5). The values 4/ of gold recovered from sample nos. 3 and 5 were $\$0.16/yd^3$ (dollars per cubic yard) and $\$0.58/yd^3$, respectively. No gold was observed in the two samples north of Sheep Creek or the sample from Sheep Creek in the middle of the WSA (fig. 2, nos. 1, 2, and, 4). No elevated gravel bars or terraces from earlier periods of deposition were observed, and the minor amount of gravel in Sheep Creek's drainage can be attributed to seasonal runoff.

Slightly iron-oxide stained, milky-colored chalcedony and weakly banded agate occur as float along the southeastern boundary of the WSA. A composite select sample of the material was collected from a small area (fig. 2, sample no. 6), but it did not contain metallic values above normal crustal abundance for the host rock.

Geodes occur as float over an area of approximately 1/4 mi^2 (square mile) within and adjacent to the WSA (fig. 2). The geodes are composed of reddish-brown, rhyolitic, ash-flow tuff (Bernt, 1983) with a white chalcedonic filling, and are of two types. An augen (eye)-shaped variety ranges from three to six in. in length by two to four in. in width, is generally hollow, and has a chalcedony-incrusted interior. The second variety is nearly round, ranges from two to four in. in diameter, and has a triangular to wedge-shaped cavity filled with chalcedony. The chalcedony fillings generally lack features, such as banding and mottling, that create high demand among rock hounds and gem dealers. No other geode occurrences were observed in or near the WSA.

Small parcels of land southwest and northeast of the WSA were leased for oil and gas in 1986.

4/ Calculations are based on an assumed gold price of $425/oz (dollars per ounce); placer gold is assumed to be 1,000 fine (pure).

APPRAISAL OF MINERAL RESOURCES

No mineral resources are identified within the Sheep Creek West WSA. Placer gold, probably from deposits associated with the mining districts in northern Nevada, occurs in the sand and gravel of Sheep Creek. The gold values are too low, and the deposits are much too small and difficult to access to support commercial mining at the current market value of gold; however, the occurrence could attract recreational panning or sluicing. The occurrence of geodes along the boundary of the WSA may be of interest to rock hounds. Lands including the Sheep Creek West WSA are classified as "prospectively valuable for oil and gas"; however, no favorable geologic structures are identified (U.S. Bureau of Land Management, 1984) .

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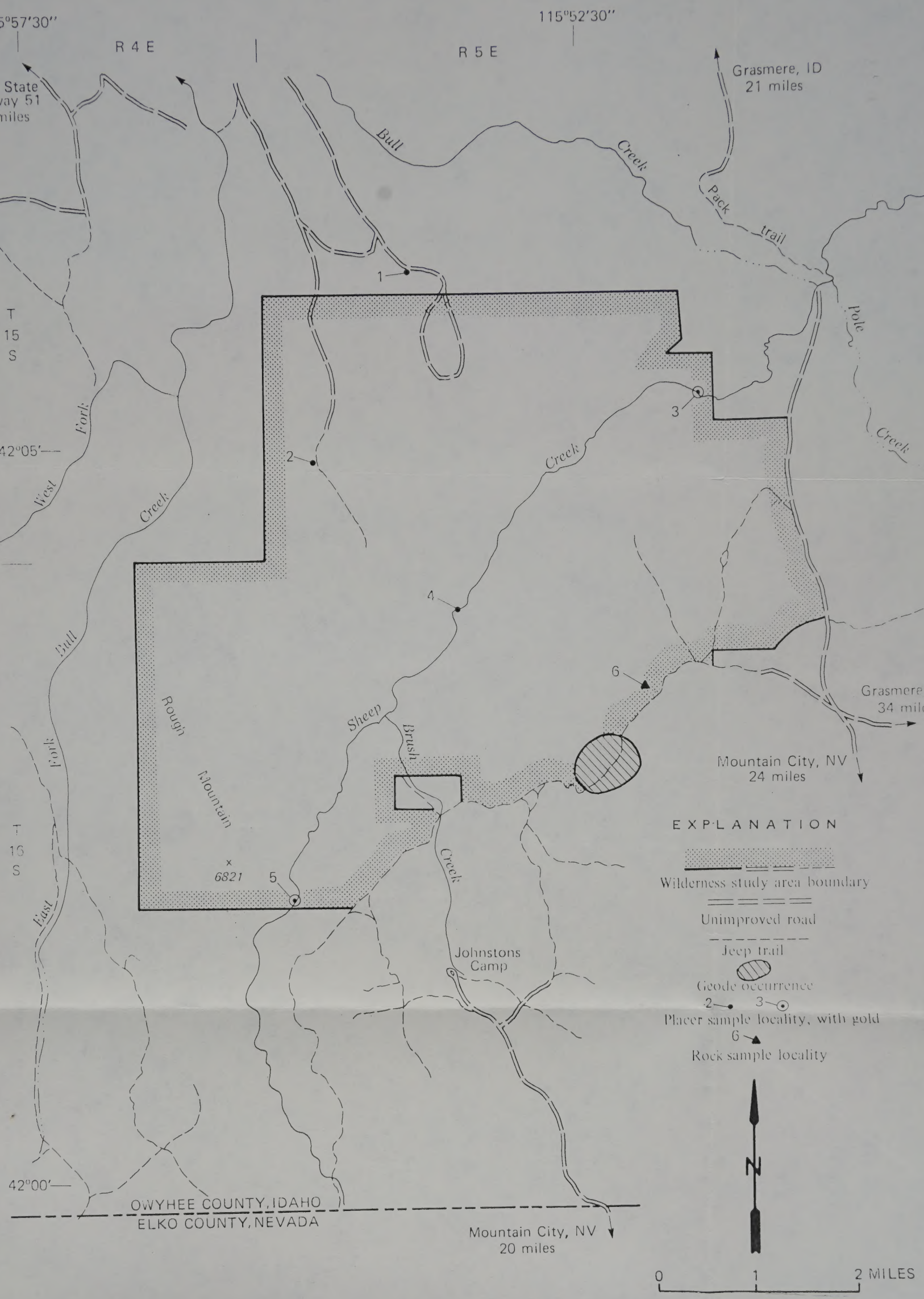

FIGURE 2.—Sample localities in or near the Sheep Creek West Wilderness Study Area (ID-111-36A), Owyhee County, ID